

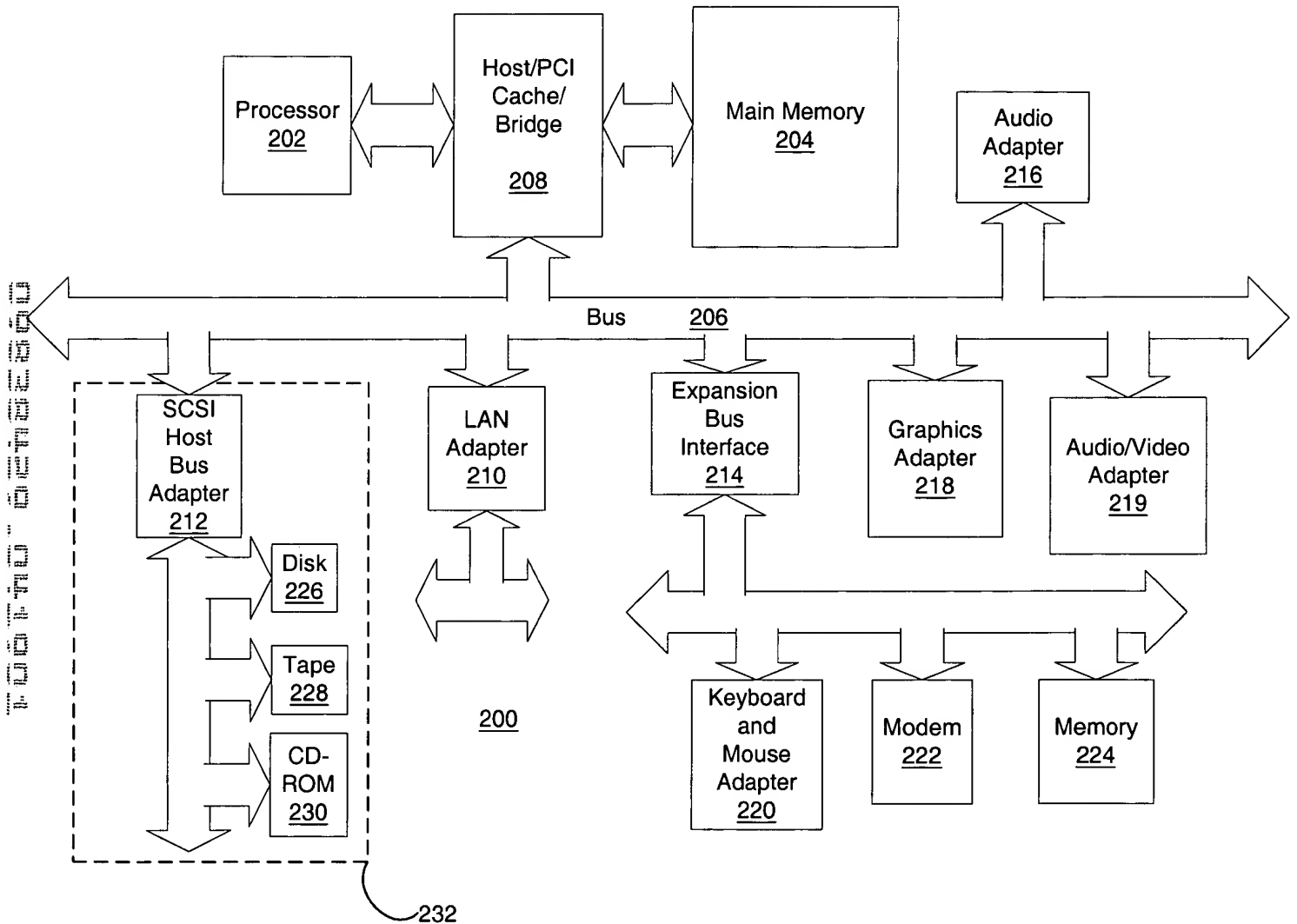
(Prior Art)

## Figure 1

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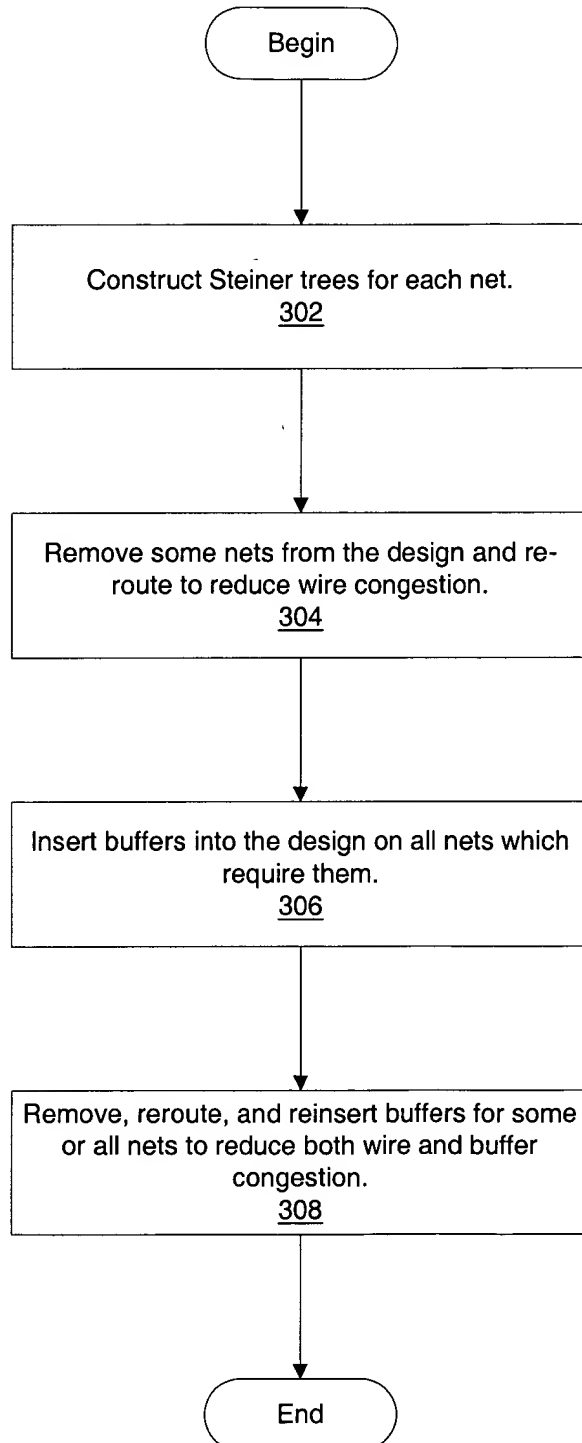
# Figure 2

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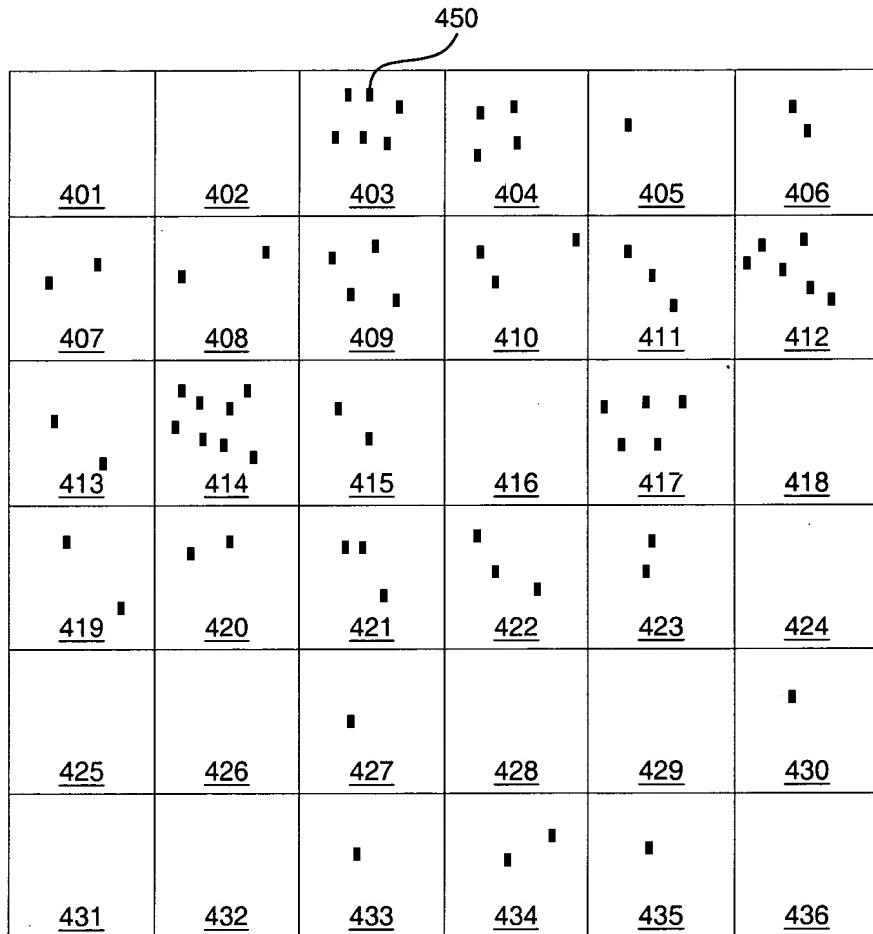
# Figure 3

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# Figure 4A

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# Figure 4B

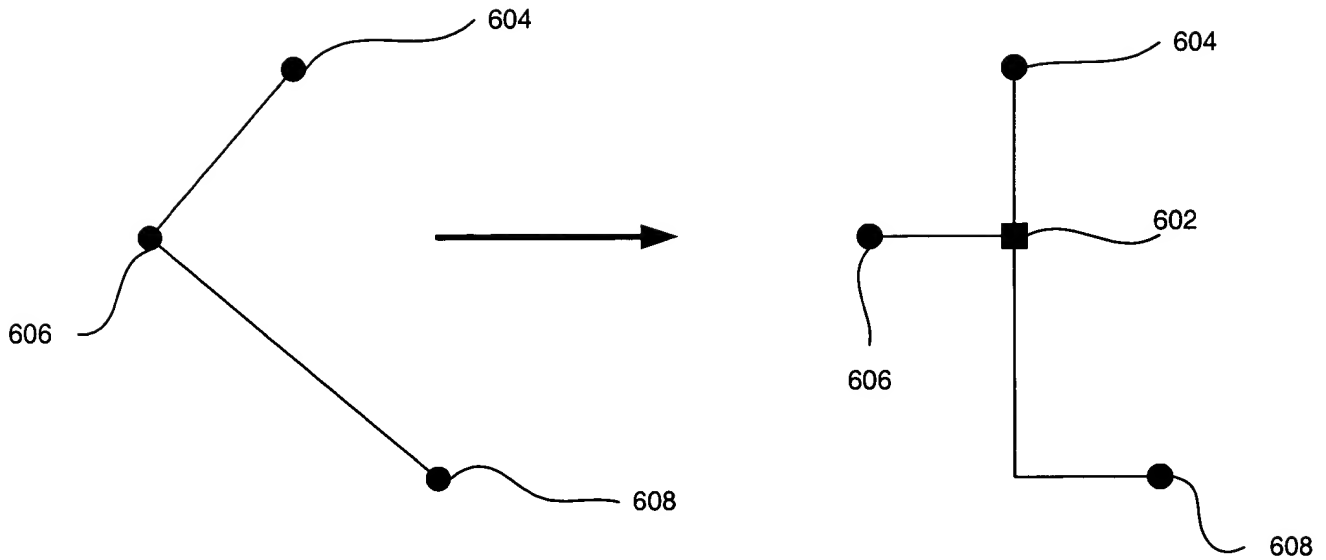
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0 <u>401</u>	0 <u>402</u>	6 <u>403</u>	4 <u>404</u>	1 <u>405</u>	2 <u>406</u>
2 <u>407</u>	2 <u>408</u>	4 <u>409</u>	3 <u>410</u>	3 <u>411</u>	6 <u>412</u>
2 <u>413</u>	8 <u>414</u>	2 <u>415</u>	0 <u>416</u>	5 <u>417</u>	0 <u>418</u>
2 <u>419</u>	2 <u>420</u>	3 <u>421</u>	3 <u>422</u>	2 <u>423</u>	0 <u>424</u>
0 <u>425</u>	0 <u>426</u>	1 <u>427</u>	0 <u>428</u>	0 <u>429</u>	1 <u>430</u>
0 <u>431</u>	0 <u>432</u>	1 <u>433</u>	2 <u>434</u>	1 <u>435</u>	0 <u>436</u>



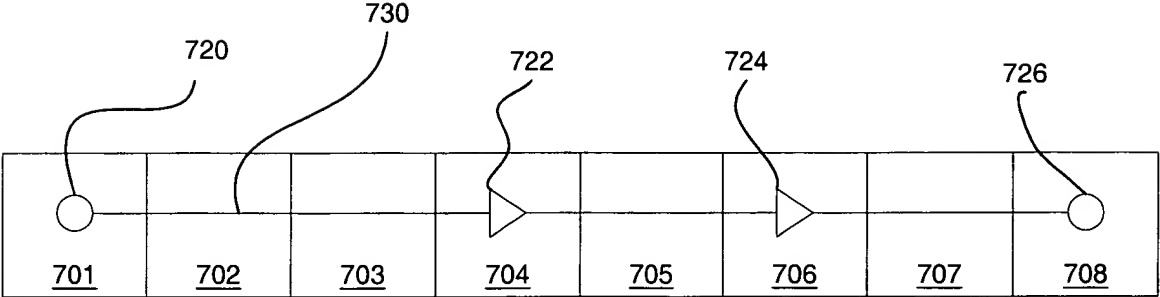
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# Figure 7

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B(v)	8	5	12	3	5	0
b(v)	3	4	2	3	0	0
p(b)	2.5	3.6	2	0.8	4	5
q(v)	1.3	8.6	0.5	$\infty$	1.0	$\infty$

FIG. 7



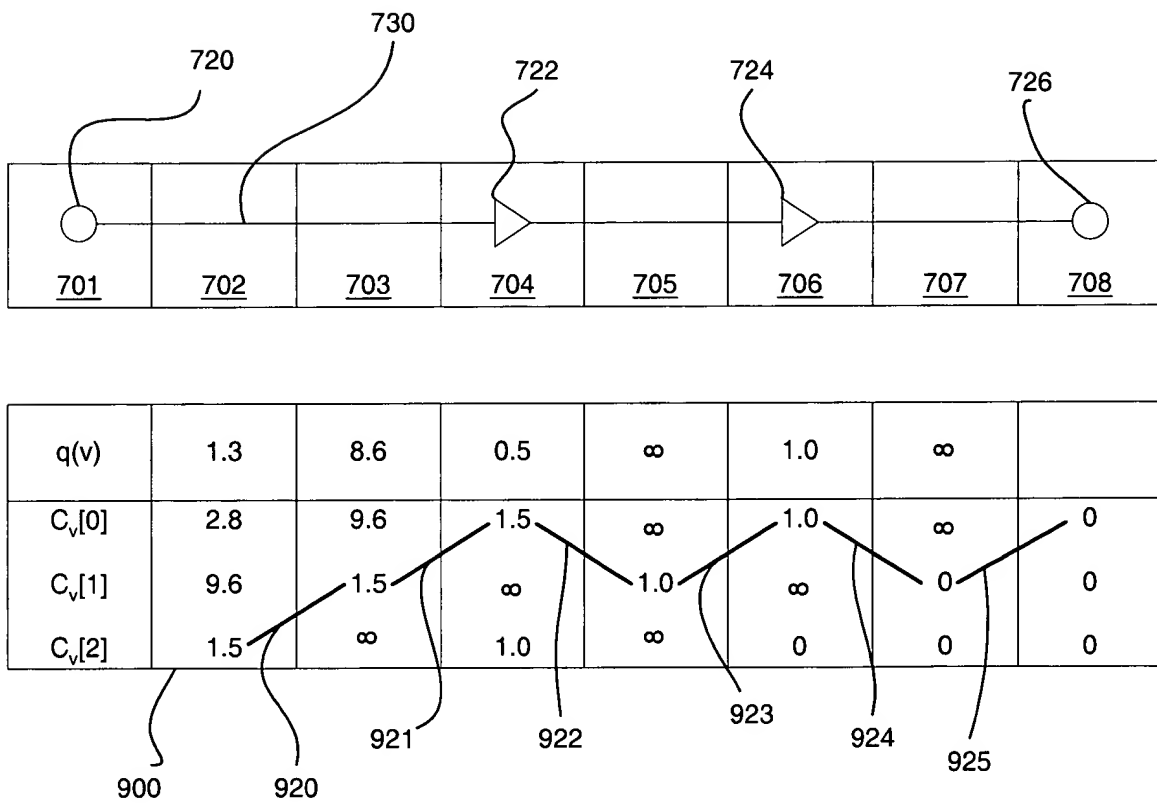
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1. Set  $C_i[j] = 0$  for  $1 \leq j < L_i$  and sink  $t$ . Set  $v = t$
2. while  $v \neq s$  do  
    for  $j = 1$  to  $L_i - 1$  do  
        Set  $C_{par(v)}[j] = C_v[j-1]$   
    Set  $C_{par(v)}[0] = q(par(v)) + \min\{C_v[j] \mid 0 \leq j < L_i\}$   
    Set  $v = par(v)$ .
3. Let  $v$  be such that  $par(v) = s$ . Return  $\min\{C_v[j] \mid 0 \leq j < L_i\}$ .

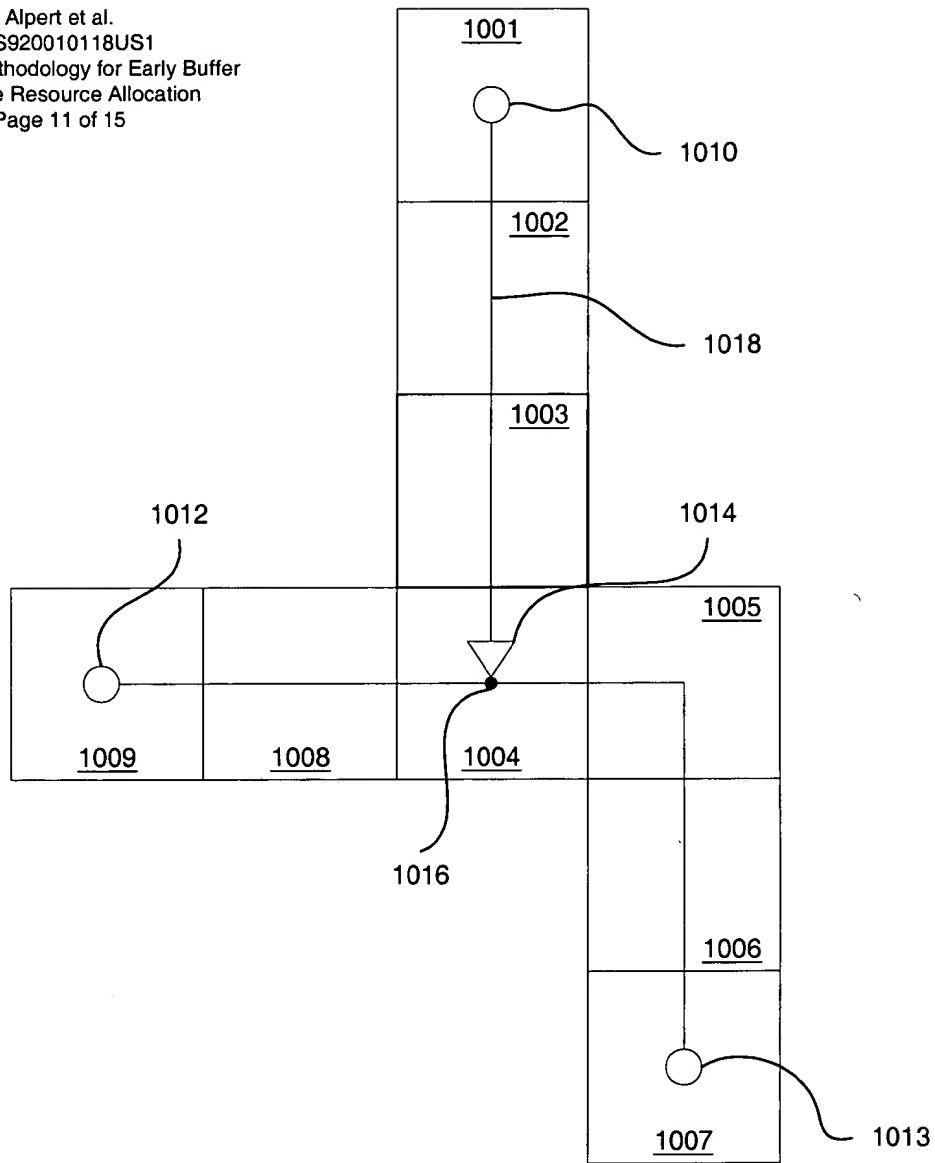
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# Figure 10A

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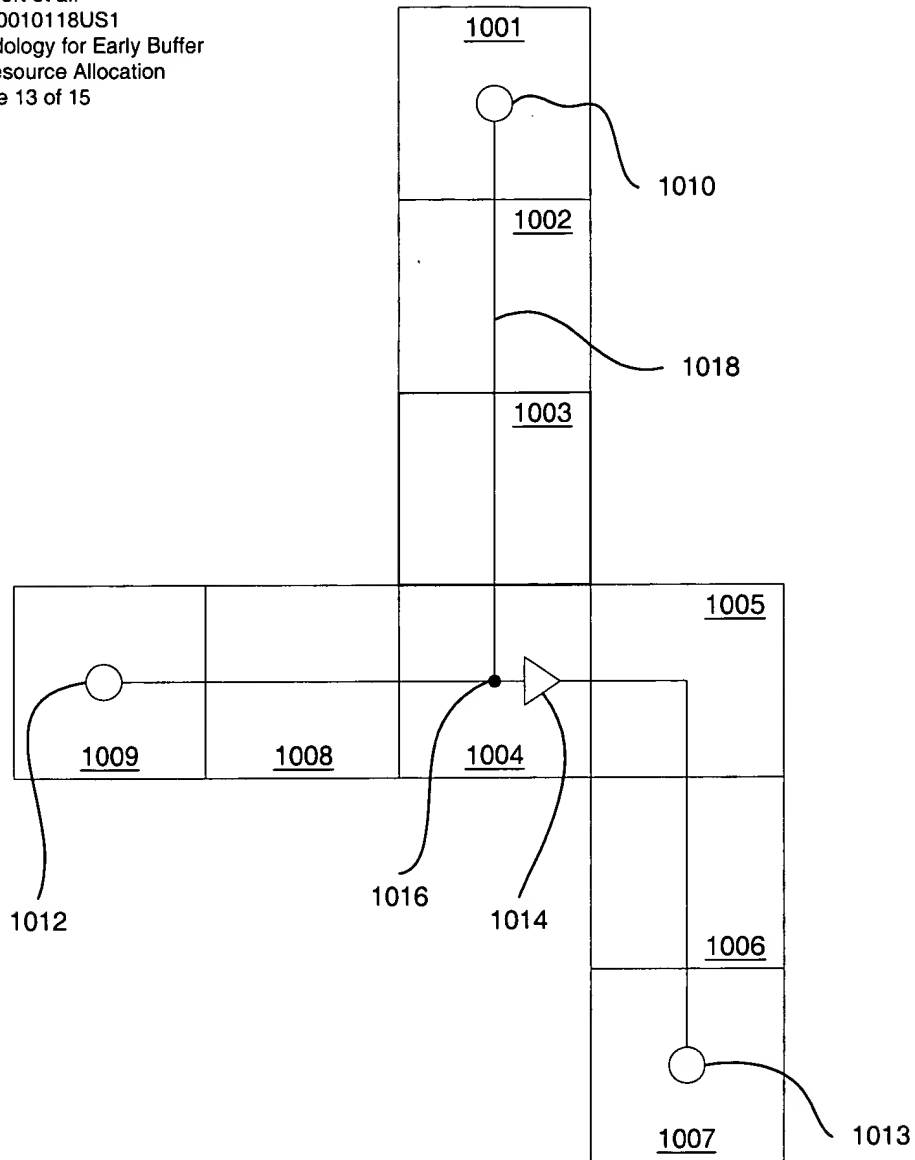


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# Figure 10C

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# Figure 11

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1. Pick an unvisited node  $v$  such that all descendants of  $v$  have been visited.  
  
While  $v \neq s$  do
2. if  $v$  is a sink then  
Set  $C_v[j] = 0$  for  $1 \leq j < L_i$ .
3. if  $v$  has one child  $l(v)$  then  
for  $j = 1$  to  $L_i - 1$  do  
Set  $C_v[j] = C_{l(v)}[j-1]$   
Set  $C_v[0] = q(v) + \min\{C_{l(v)}[j] \mid 0 \leq j < L_i\}$
4. if  $v$  has two children  $l(v)$  and  $r(v)$  then
  - 4.1 for  $j = 2$  to  $L_i - 1$  do  
Set  $C_v[j] = \min\{C_{l(v)}[j_l] + C_{r(v)}[j_r] \mid j_l + j_r + 2 = j\}$
  - 4.2 Set  $C_v[0] = q(v) + \min\{C_{l(v)}[j_l] + C_{r(v)}[j_r] \mid j_l + j_r + 2 \leq L_i\}$
  - 4.3 Set  $C_v[1] = \infty$
  - 4.4 for  $j = 1$  to  $L_i - 1$  do  
Set  $C_v[j] = \min\{C_v[j], q(v) + C_{l(v)}[j-1], q(v) + C_{r(v)}[j-1]\}$
5. mark  $v$  as visited  
pick an unvisited node  $v$  such that all descendants of  $v$  have been visited.
6. Return  $\min\{C_s[j] \mid 0 \leq j < L_i\}$ .

# Figure 12

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